Headquarters U.S. Air Force

Building Joint Network-Centric Warfare Capabilities

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Deputy Chief of Staff
Warfighting Integration
September 2004

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USAF NCW Vision

A Fully Integrated Digital System Which Delivers Seamless, Survivable, Instant Capability to Execute the Joint Force Commander's Desired Effects

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Making NCW Real

OBJECTIVE: Field Decisive Coalition Combat Capability

Achieve

EFFECTS: Decision Superiority – PBA & EBO
Rapid, Correct Effect
Greater Precision

Need

CAPABILITIES: Global Network Connectivity
Network-Enabled Platforms
Fused Intel
Real Time SA & C2

Robust, Reliable Connectivity & Great Applications

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Breaking it Down

ROBUST CONNECTIVITY Equal $ GREAT APPLICATIONS

- **C4ISR Flight Plan**
- **GIG Connected Command Centers**
  CAOC/CFLCC/CFMCC > BCC-X > ASOC
- **BLOS Net to Mobile nodes**
  JTEP, ROBE, MMP & E-10
- **BIG – Medium Mobile IP Networks**
  4X Comm & CDL > TTNT and WNW
- **TTP**
  JDICE, Super JICO's

- **Situational Awareness**
  CTP, COP, FIOP, BFT Tracks, GCS, WX
- **PBA – Short & Long Dwell Intel Fusion**
  IWPC, JTT, ICCOPI, ISISP
- **EBO – Deliver the right verifiable Effect**
  Control & Coordination - ISR Warrior, ACASSA
  Targeting – Gridlock, Suter III, AT3, NCCT
  BDA & Results – DLARS
- **Combat Operations Support**

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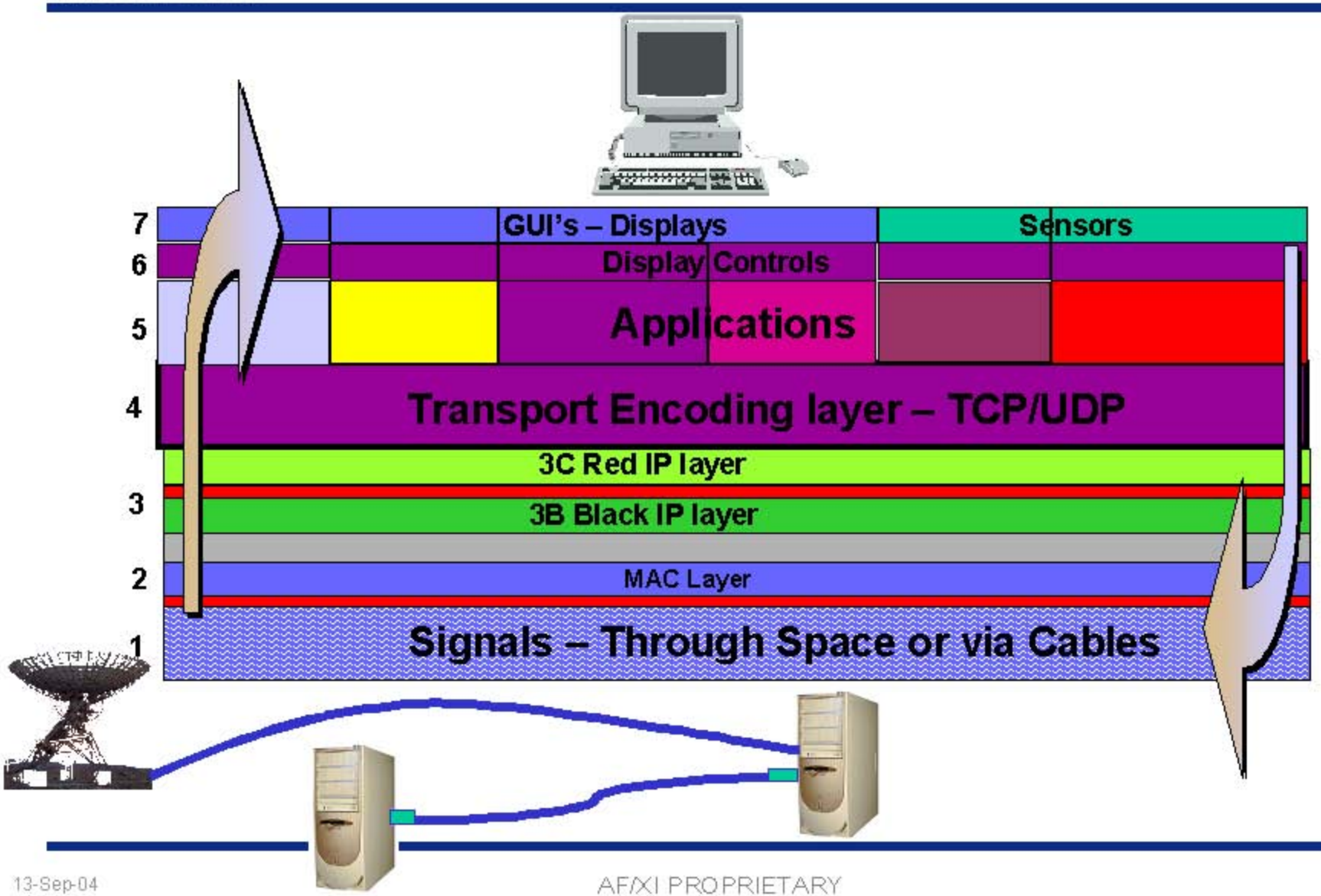
Standard IP Model



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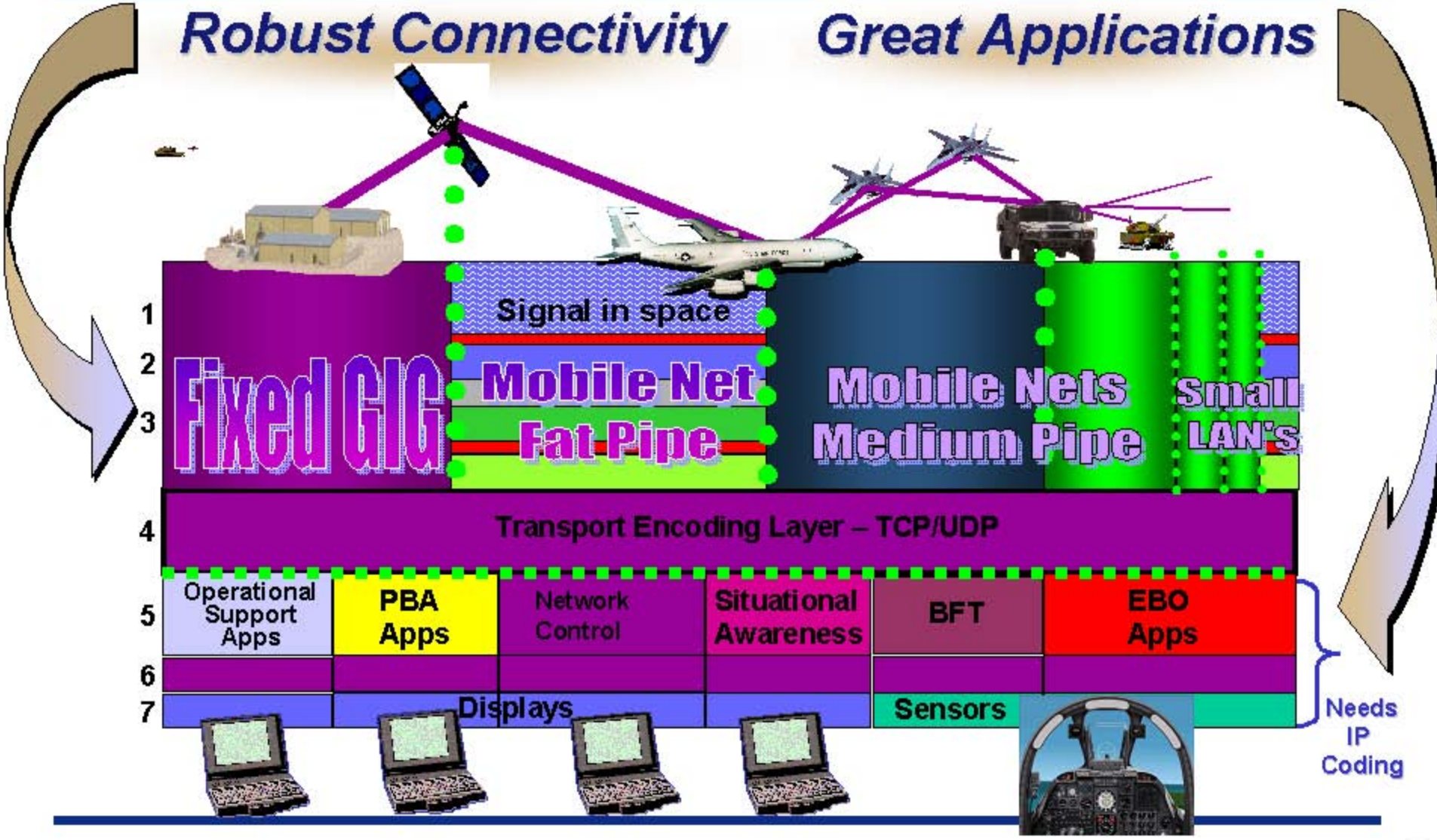
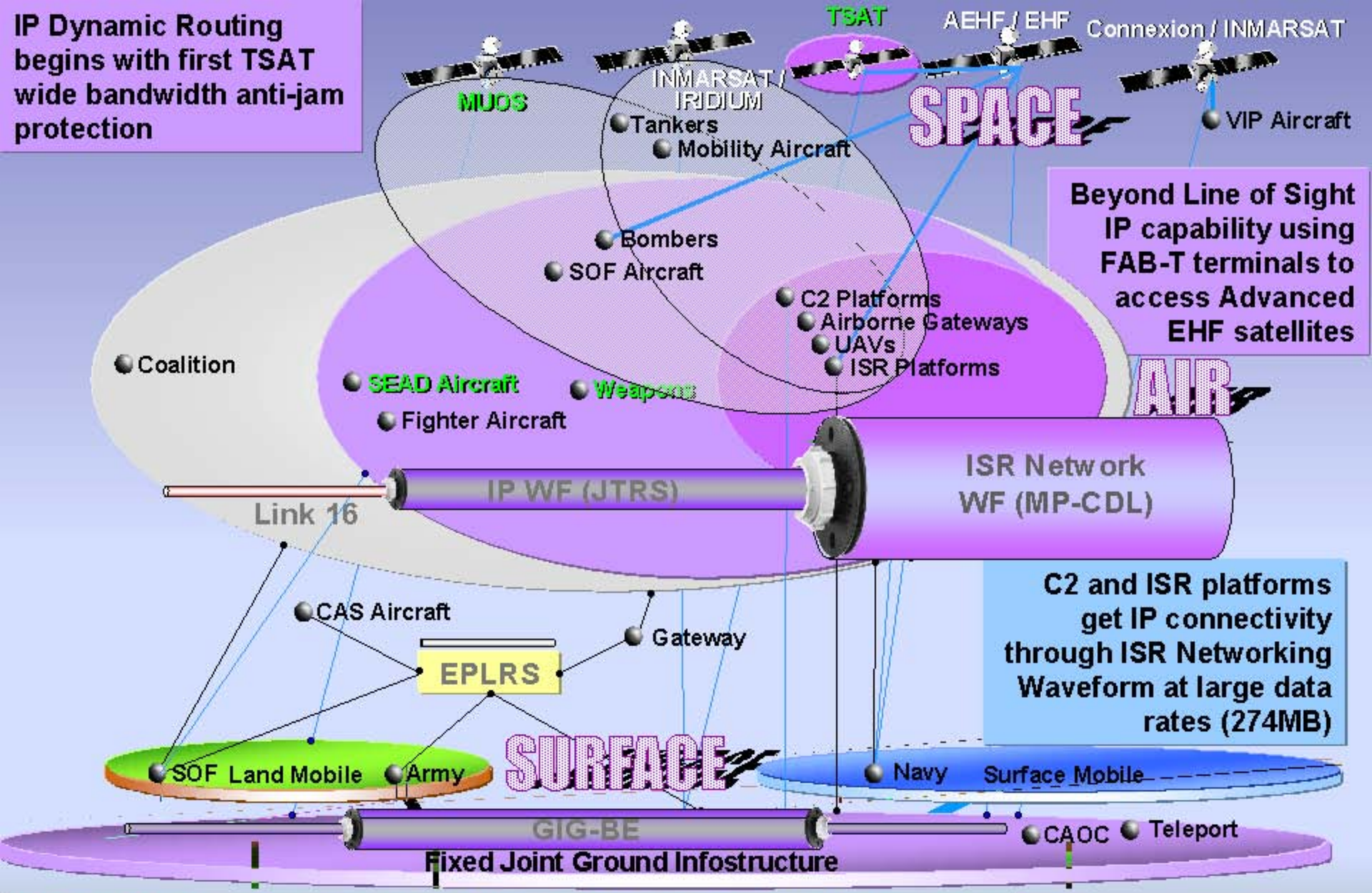
NCW - Concept to Technical

Robust Connectivity Great Applications





FY 13 Constellation Net

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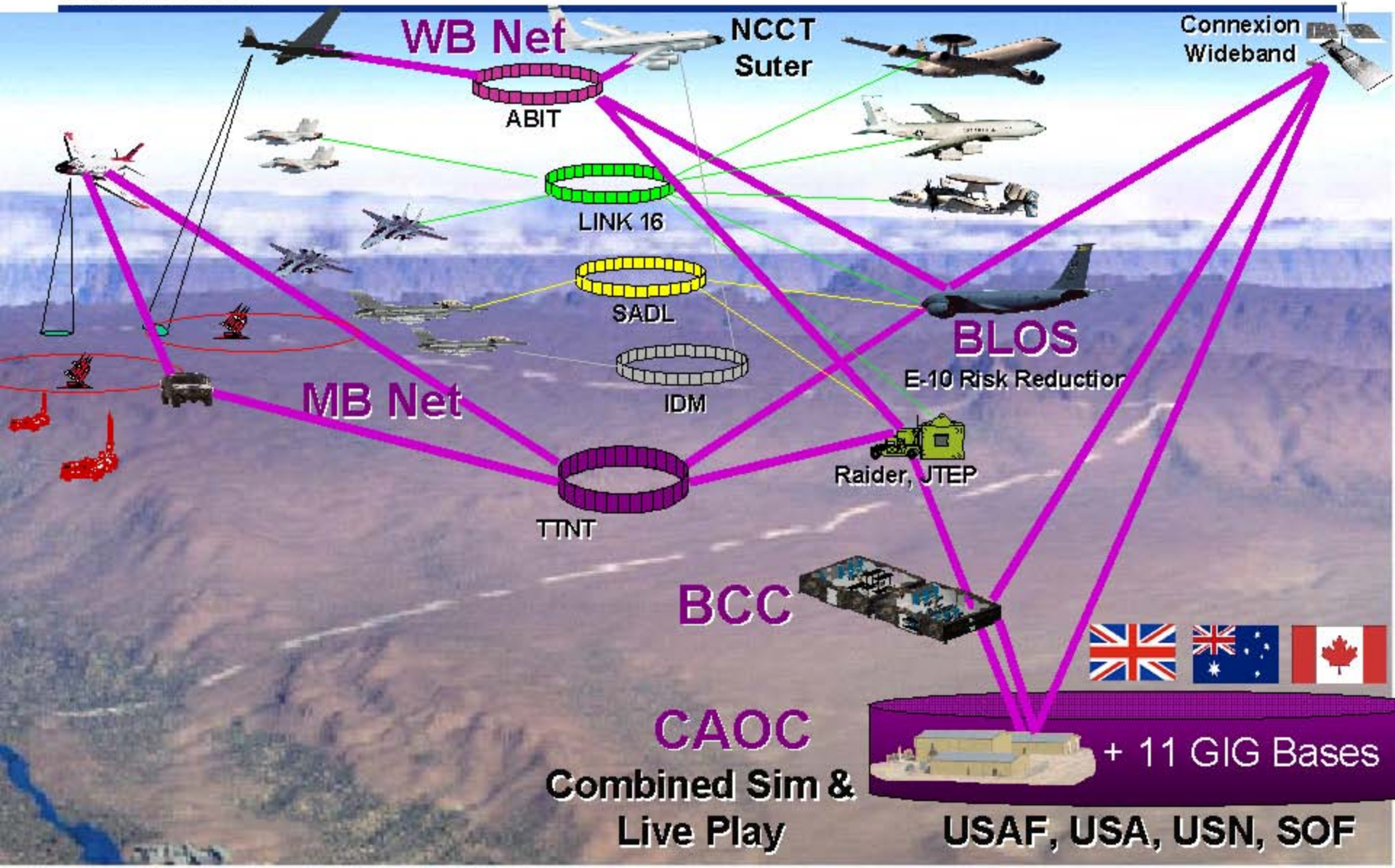
Coalition JEFX 04

Combination TADL & Mobile IP



CAOC Function

Combat Ops
TST Cell
CAS Cell

BCD
LNOs
Coalition Coord

JICO &
Network
Management

Combat
Ops Support -
WX
Mobility

ISR
Control &
Coord

Coordination

Intel

Plans

JFACC Staff

IP Apps

4	Transport Encoding Layer – TCP/UDP					
5	Operational Support Apps	PBA Apps	Network Control	Situational Awareness	BFT	EBO Apps
6						
7	Displays				Sensors	

Deploying Situational Awareness

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BCC Architecture

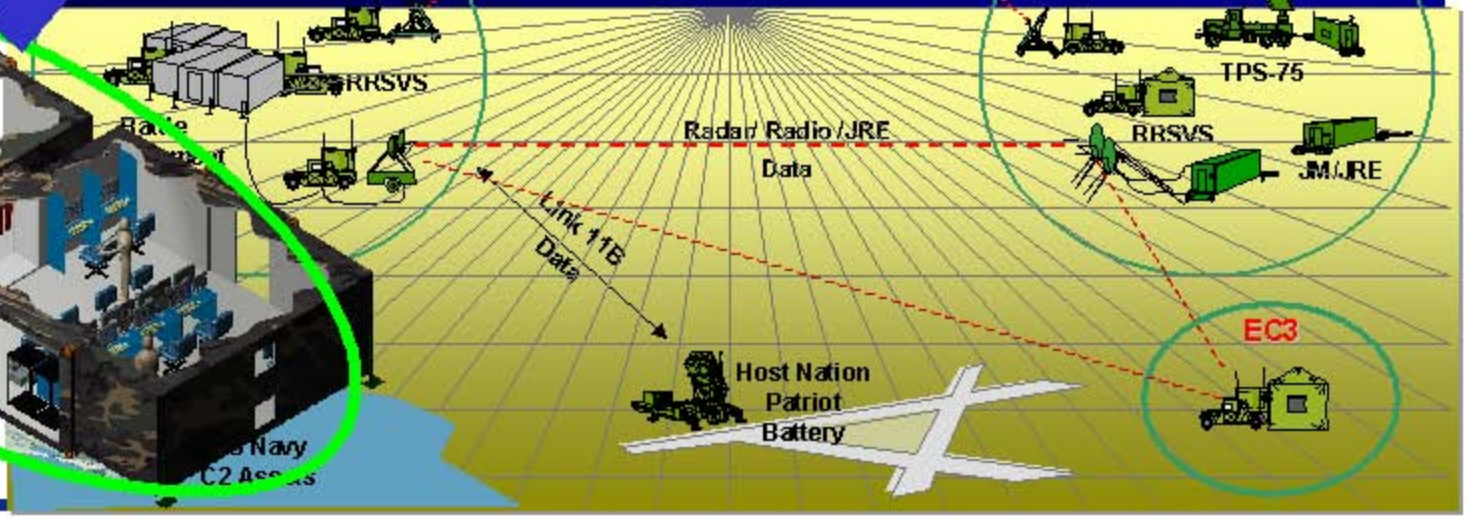
Mix of Legacy TADLs & Migration to IP

CRC
(Legacy)

BCC – Patriot, AEGIS, AWAC's, E-2

ASOC – Ground Force Coordination

BCC-X
(Prototype)



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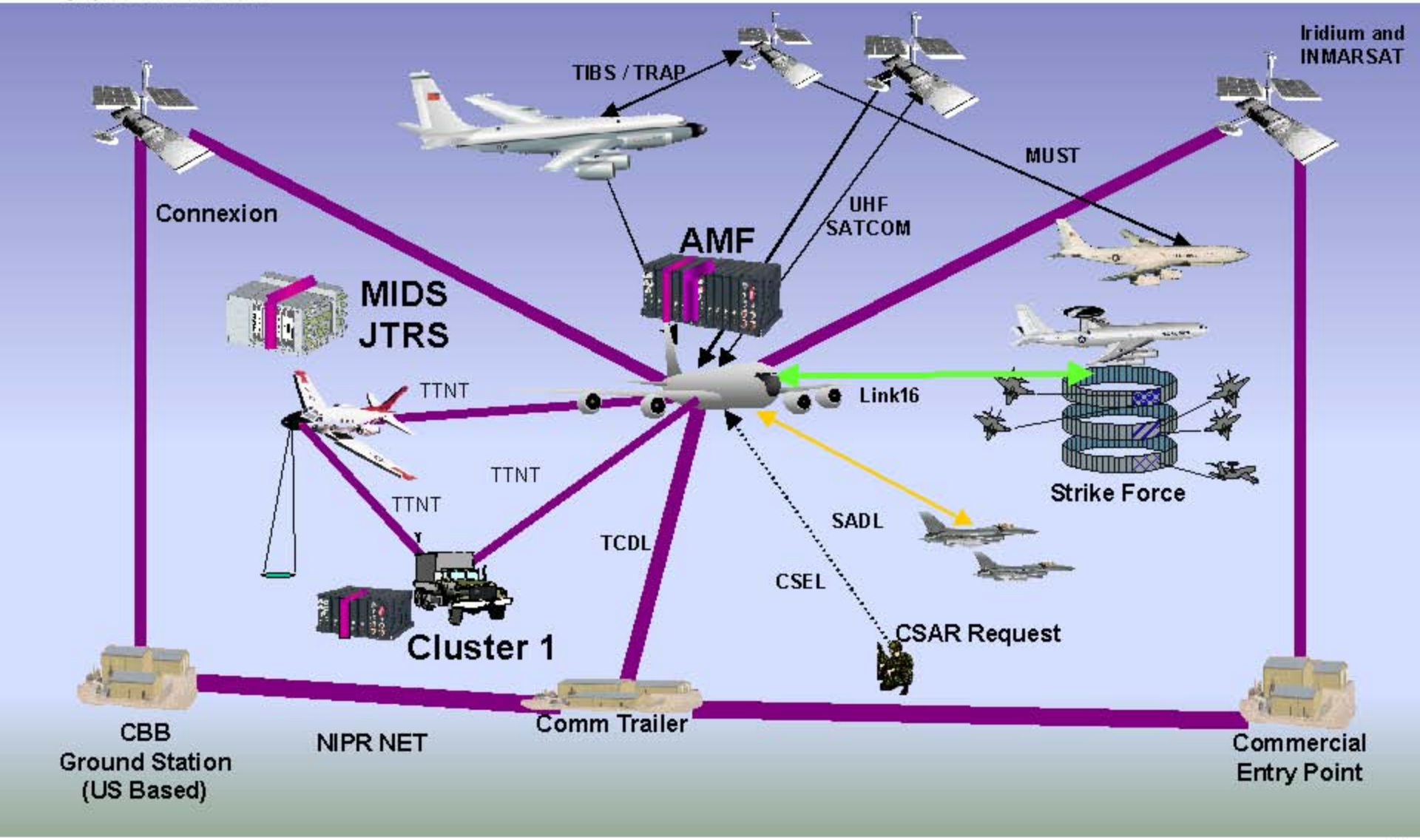
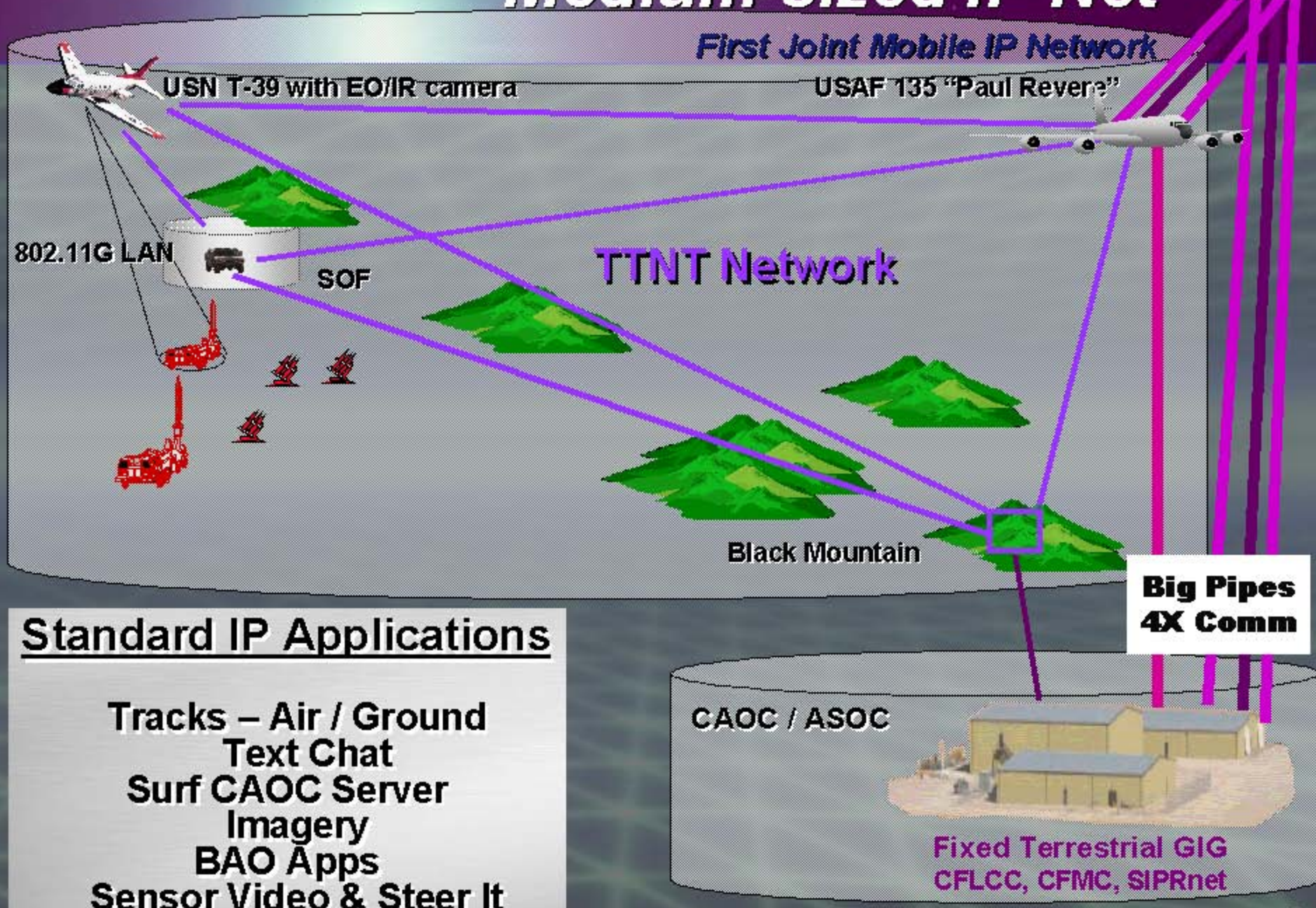
Wide Band Net Forwarding

Paul Revere Risk Reduction > E-10



Medium-sized IP Net



Standard IP Applications

Tracks – Air / Ground
Text Chat
Surf CAOC Server
Imagery
BAO Apps
Sensor Video & Steer It

TADL to IP Transition

Cluster 1, MIDS JTRS, AMF

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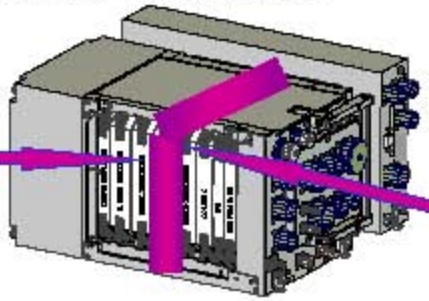
Cluster 1

MIDS JTRS AMF



AMF

Ground TACP

Tactical

Fighter / Bombers

JTRS Hardware

Antenna

Power AMPS

Aircraft Interfaces

C2ISR Platforms

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Critical Enablers to Net Centric Ops

- **Global Network Connectivity**
  - *TSAT
  - *APS
  - *MMP
  - *GIG-BE
  - *CITS-Net Ops / IA
  - *IPv6
  - *Teleport
  - WGS
  - AEHF
  - ETP Follow On
  - MUOS
  - TDC
  - CRC
  - NCES
  - Crypto Mod
  - ROBE / JTEP
- **Network-Enabled Platforms/Weapons**
  - *JTRS
  - *TTNT-like WF
  - *MP-CDL
  - *FAB-T
  - *GMT
  - Link 16
  - TACP-M
  - WDL
- **Fused Intel**
  - *DCGS
  - *NCCT / AT3
- **Real Time C2 and SA**
  - *MC2A
  - *AOC Upgrades
  - MP-RTIP
  - SBIRS
  - SBR
  - GPS
  - METSAT / NPOESS
  - Aircraft and Sensor Upgrades
  - GCCS-AF
  - JC2
  - CID
  - BFT
  - FIOP

* Indicates critical path enduring programs and essential technologies providing:

- IP-based routing
- Shared data access
- Assured service
- Essential technology
- Evolutional combat capabilities

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Successful JEFX-04 Demonstrations

Critical Enablers to Net Centric Ops

1st Airborne IP Network

*MC2A
*AOC Upgrades

*TTNT-like WF
*MP-CDL

1st Robust IP Forwarding – Paul R.

*GIG-BE
*CITS-Net Ops / IA

Link 16
TACP-M

Air & Gnd SA & BFT

Connected 11 GIG Bases

*DCGS
*NCCT / AT3

1st Net Centric Targeting App

BFT
FIOP

Both Sim & Live Tracks thru CoT

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Breaking it Down Applications

ROBUST CONNECTIVITY

- C4ISR Flight Plan
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- BLOS Net to Mobile nodes - JTEP, ROBE, MMP & E-10
- BIG – Medium Mobile IP Networks 4X Comm & CDL > TTNT and WNW
- TTP - How to use it, JDICE, Super JICO's

GREAT APPLICATIONS

- Situational Awareness
  CTP, COP, FIOP, BFT Tracks, GCS, WX
- PBA – Short & Long Term Intel Fusion
  Planning tools - IWPC, JTT, ICCOPI, ISISP
- EBO – Correct Effect with verification
  Control & Coordination - ISR Warrior, ACASSA
  Targeting – Gridlock, Suter III, AT3, GNCST
  BDA & Results – DLARS
- Operational Support Modernization

IP Use in JEFX 04

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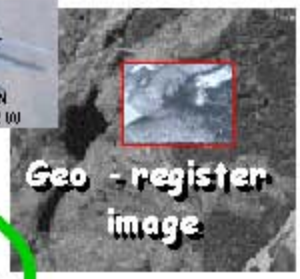
NCCT
M2M sensor cueing

SUTER III
Space, ISR
& IO integration

ISISP
Integrated space picture

SIRS
Find SATCOM jammers

ICCOPI
IO
Defensive Ops



CAOC

GCS
M2M MAF/CAF
planning data
exchange

GRIDLOCK
Rapid target mensuration

VEST
Merges two log tools
Blue bases status

PBA / EBO
Multi-INT fusion,
Strategy development

CAS/SA
BFT to GCCS

JSCOPE
Synch AOC COP
with SOF

FIOP – AOR SA Application

Merging Picture Domains

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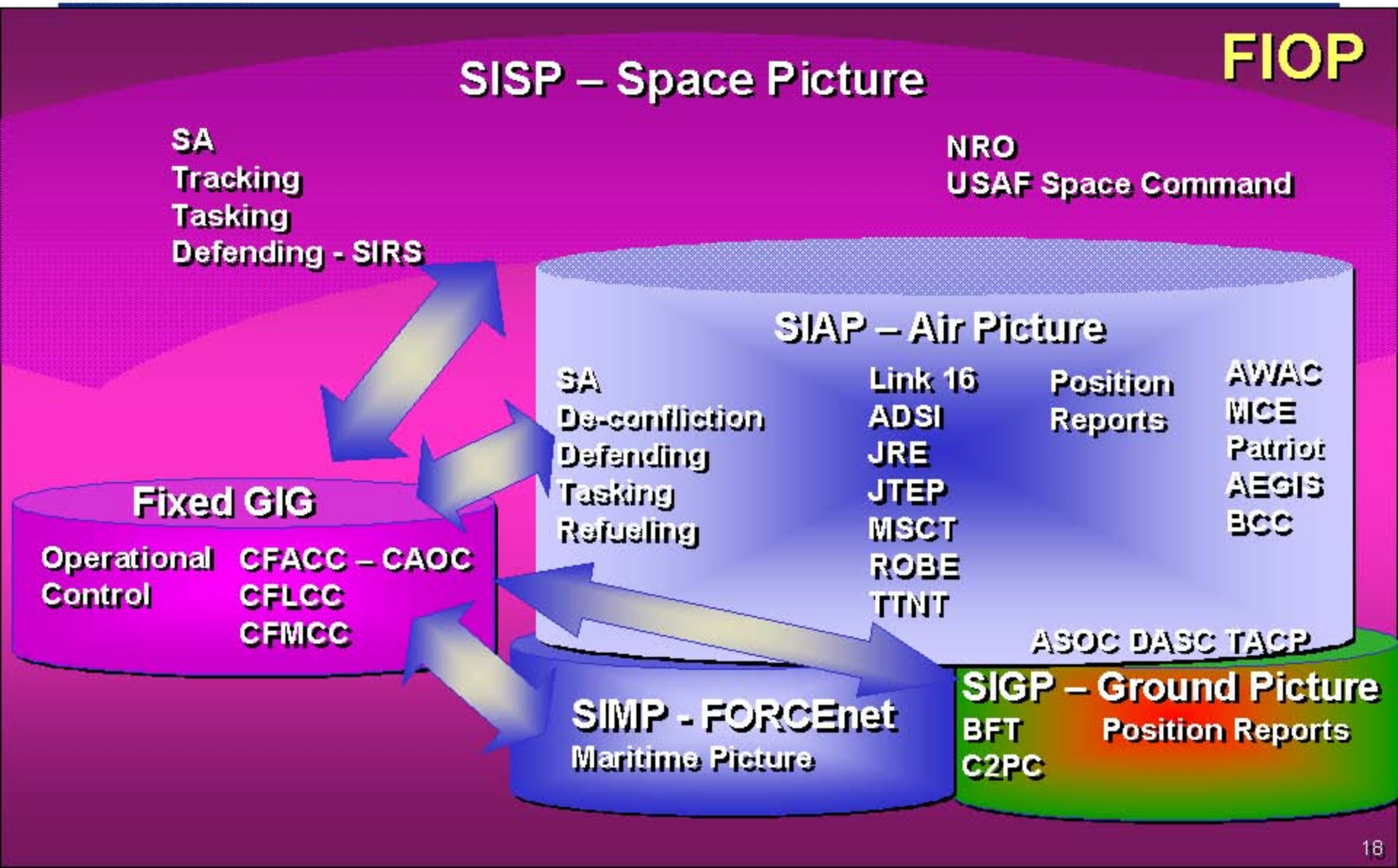
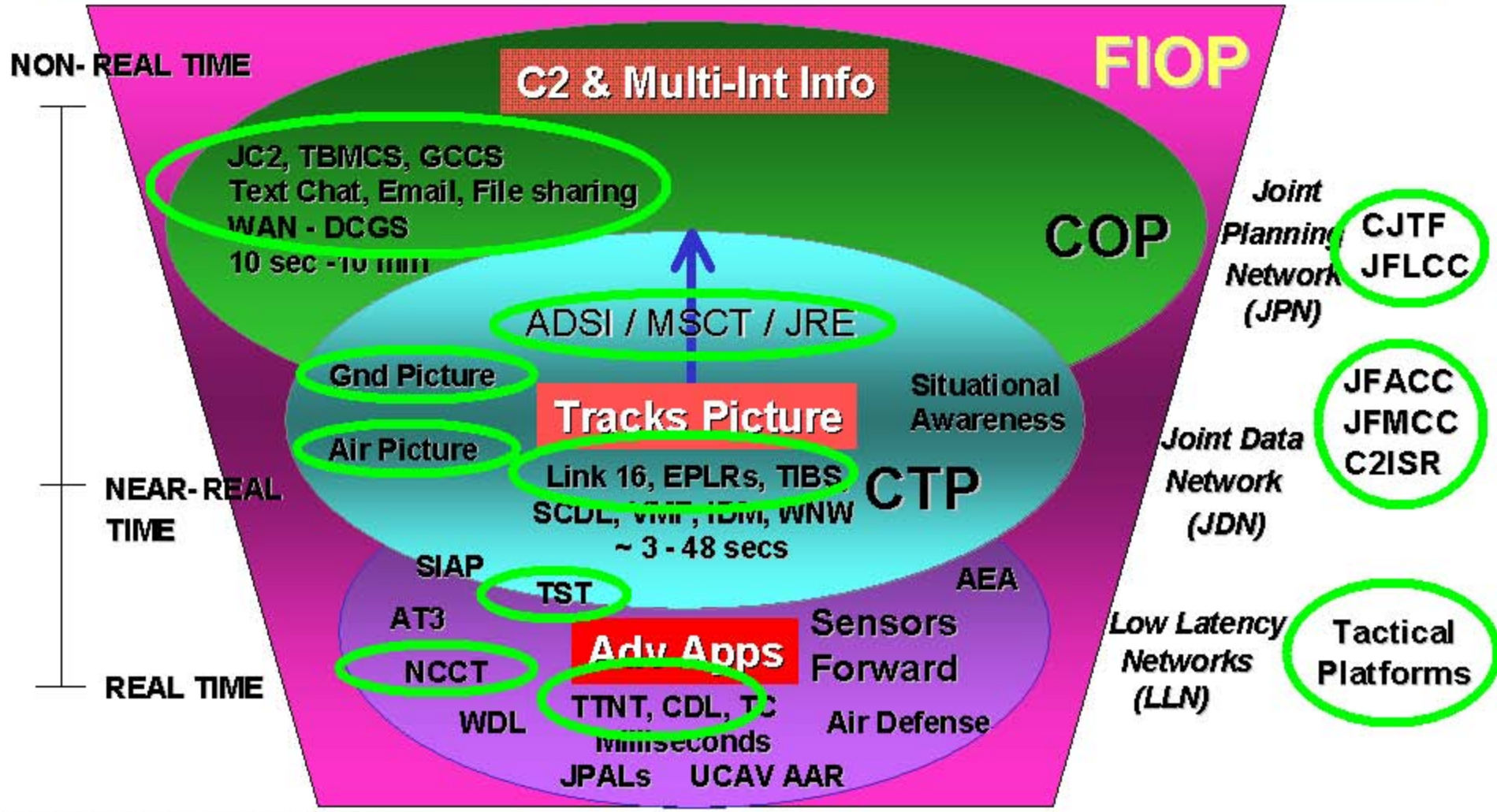


User Latency Requirements

Enabling Tools

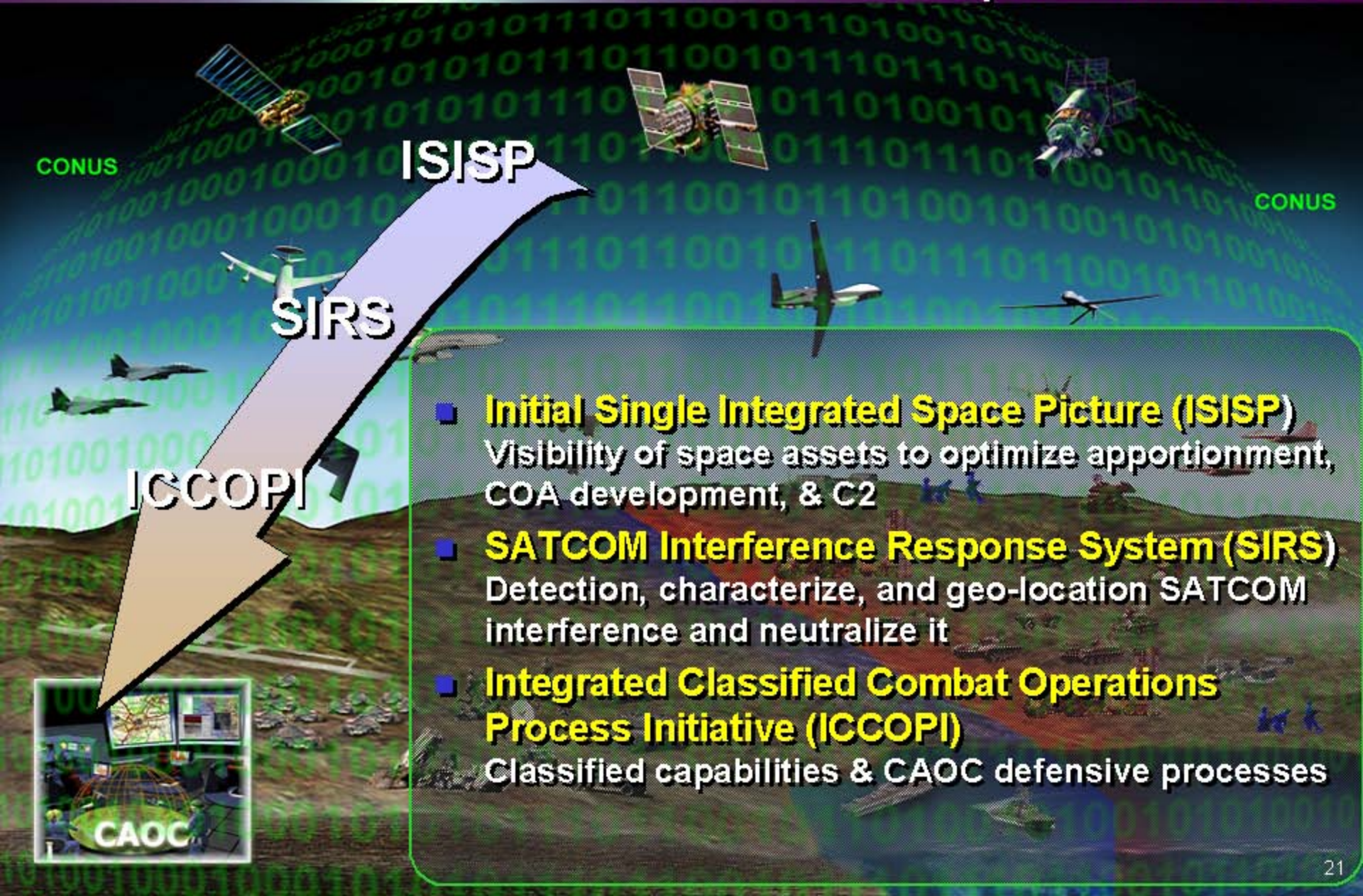


FIOP = Family of Interoperable Pictures
COP = Common Operational Picture
CTP = Common Tactical Picture

Enhancing SA

- M2M WX
- Global CONOPS Synchronization (GCS)
  - Real-time M2M XML data exchange among C2 planning & execution systems and airborne assets
- Visualization of Expeditionary Sites Tool (VEST)
  - Merges two critical logistics tools—LOGCAT and GeoReach
  - Adds enhanced visualization and analysis capability

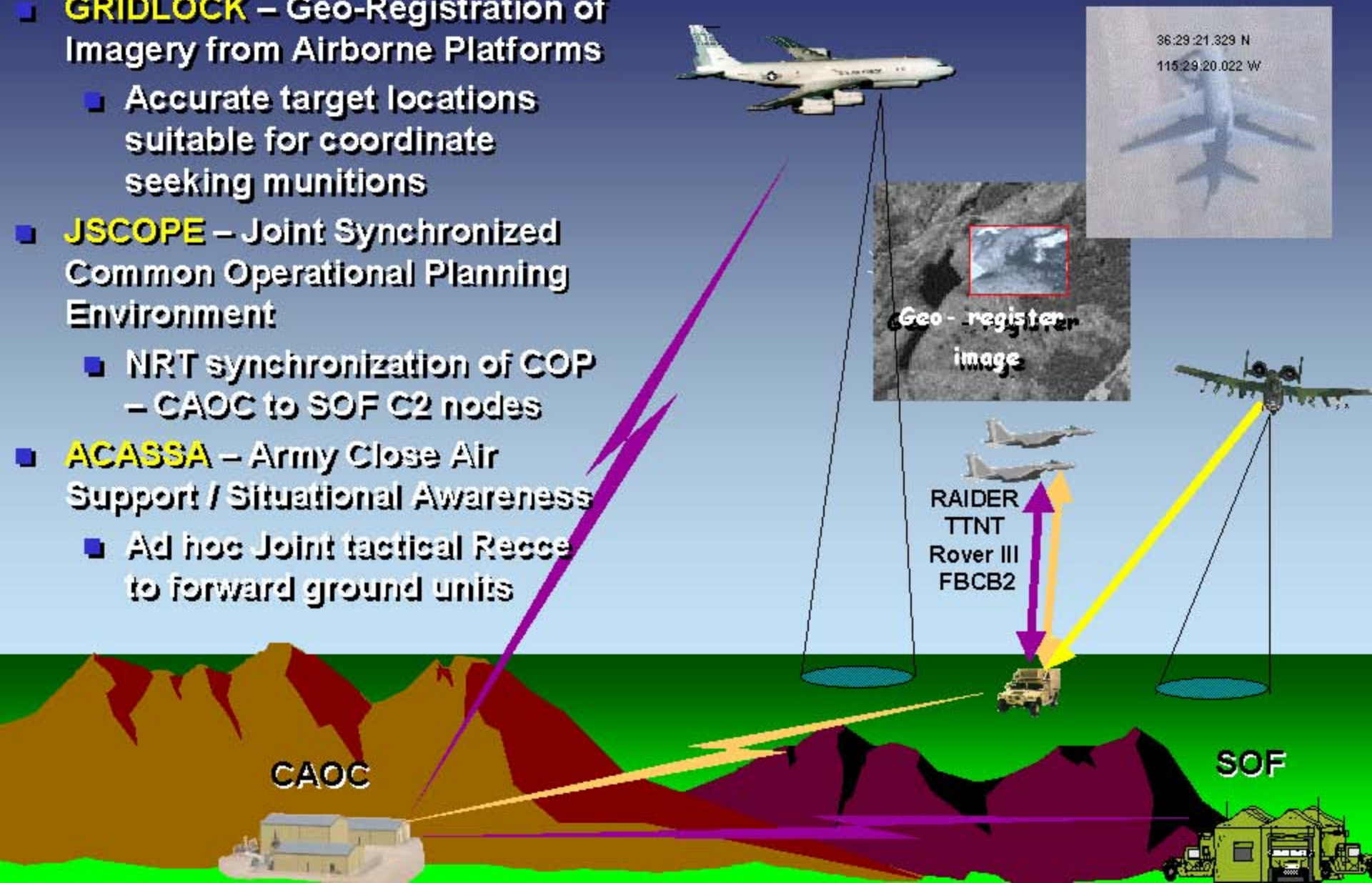
PBA
Predictive Battlespace Awareness



- **Initial Single Integrated Space Picture (ISISP)**
  Visibility of space assets to optimize apportionment, COA development, & C2
- **SATCOM Interference Response System (SIRS)**
  Detection, characterize, and geo-location SATCOM interference and neutralize it
- **Integrated Classified Combat Operations Process Initiative (ICCOPI)**
  Classified capabilities & CAOC defensive processes

EBO
Effects Based Operations

- **GRIDLOCK** – Geo-Registration of Imagery from Airborne Platforms
  - Accurate target locations suitable for coordinate seeking munitions
- **JSCOPE** – Joint Synchronized Common Operational Planning Environment
  - NRT synchronization of COP – CAOC to SOF C2 nodes
- **ACASSA** – Army Close Air Support / Situational Awareness
  - Ad hoc Joint tactical Recce to forward ground units



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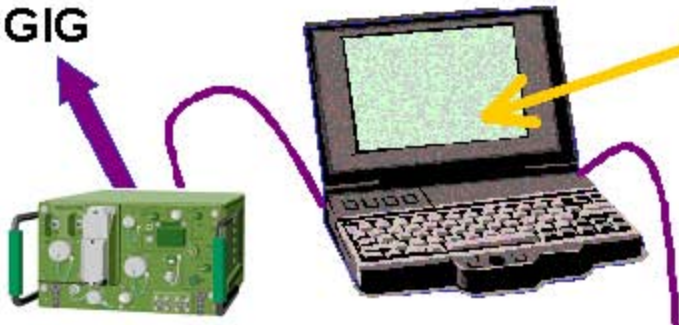
SOF & TACP Tool Work

- BAO Kit Targeting – CoT
- Video SA from A-10 Litening Pod (Rover III)



Operational Support Modernization Approach

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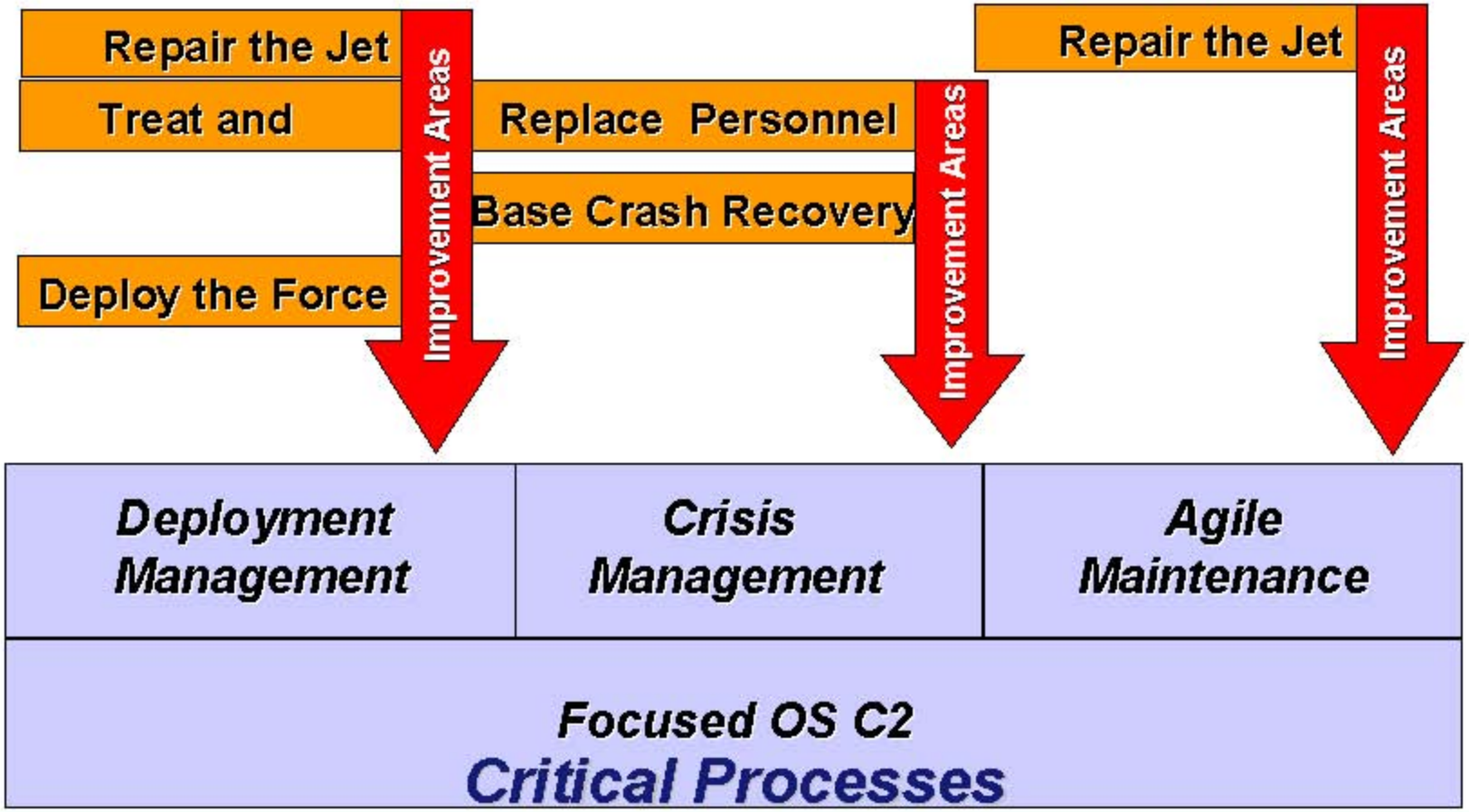
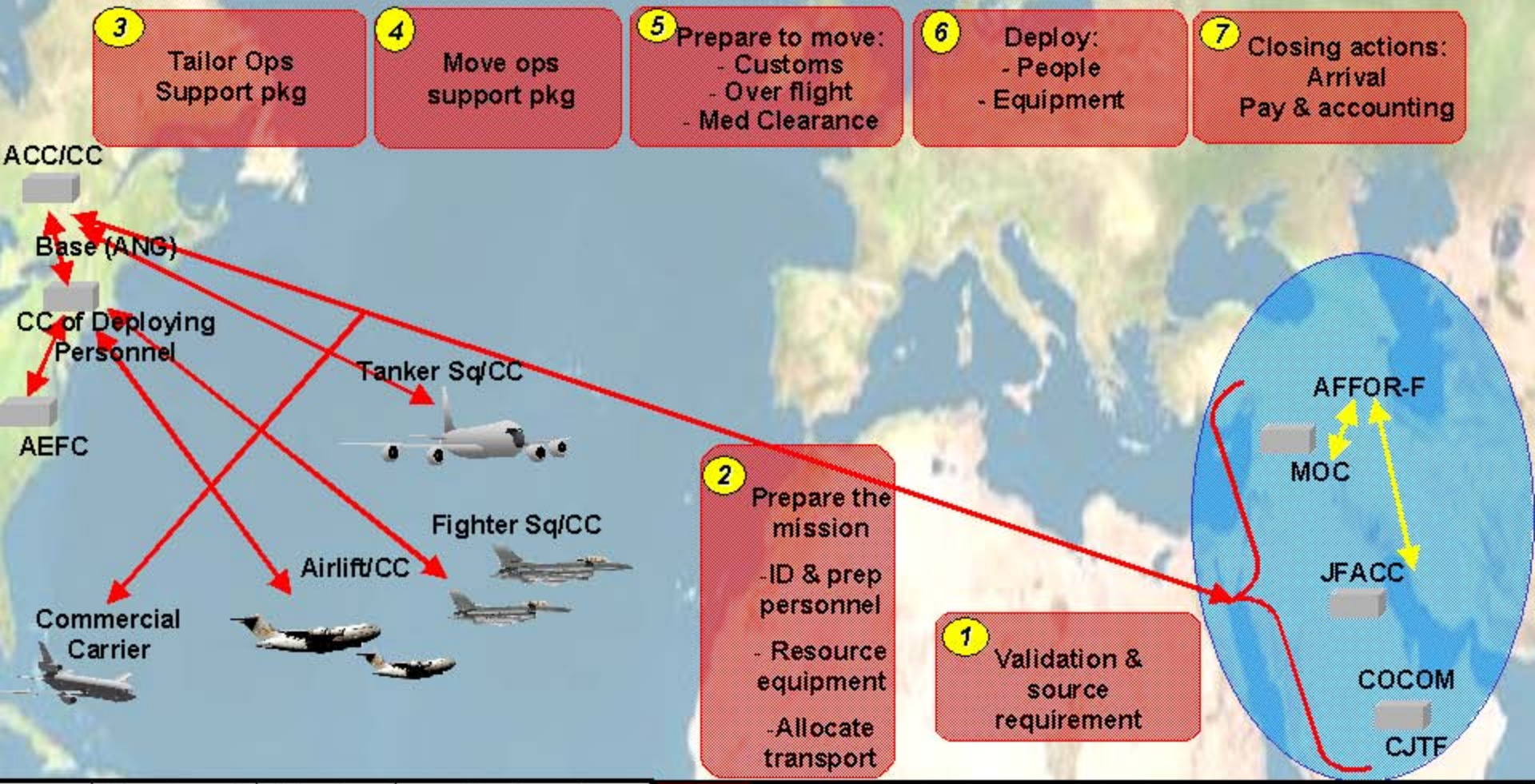
Operational Vignettes



Deployment Management 2004



	Number of manual processes (% of total)	Number of data sources	Number of processes where CC visibility is a challenge (% of total)
2004	32 (76%)	61	24 (57%)

	Manual processes, disparate data, little / fragmented CC visibility
	Some automation, limited shared data, limited CC visibility
	Automated processes, shared data, full CC visibility

Deployment Management 2011
(Based on planned FYDP improvements)

3 Tailor Ops Support pkg

4 Move ops support pkg

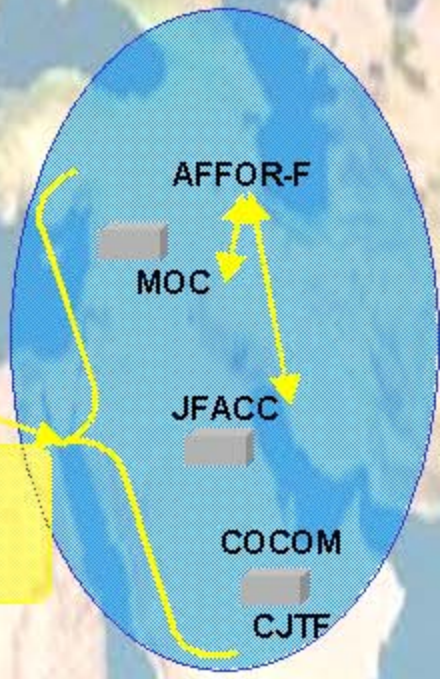
5 Prepare to move:
- Customs
- Over flight
- Med Clearance

6 Deploy:
- People
- Equipment

7 Closing actions:
Arrival
Pay & accounting

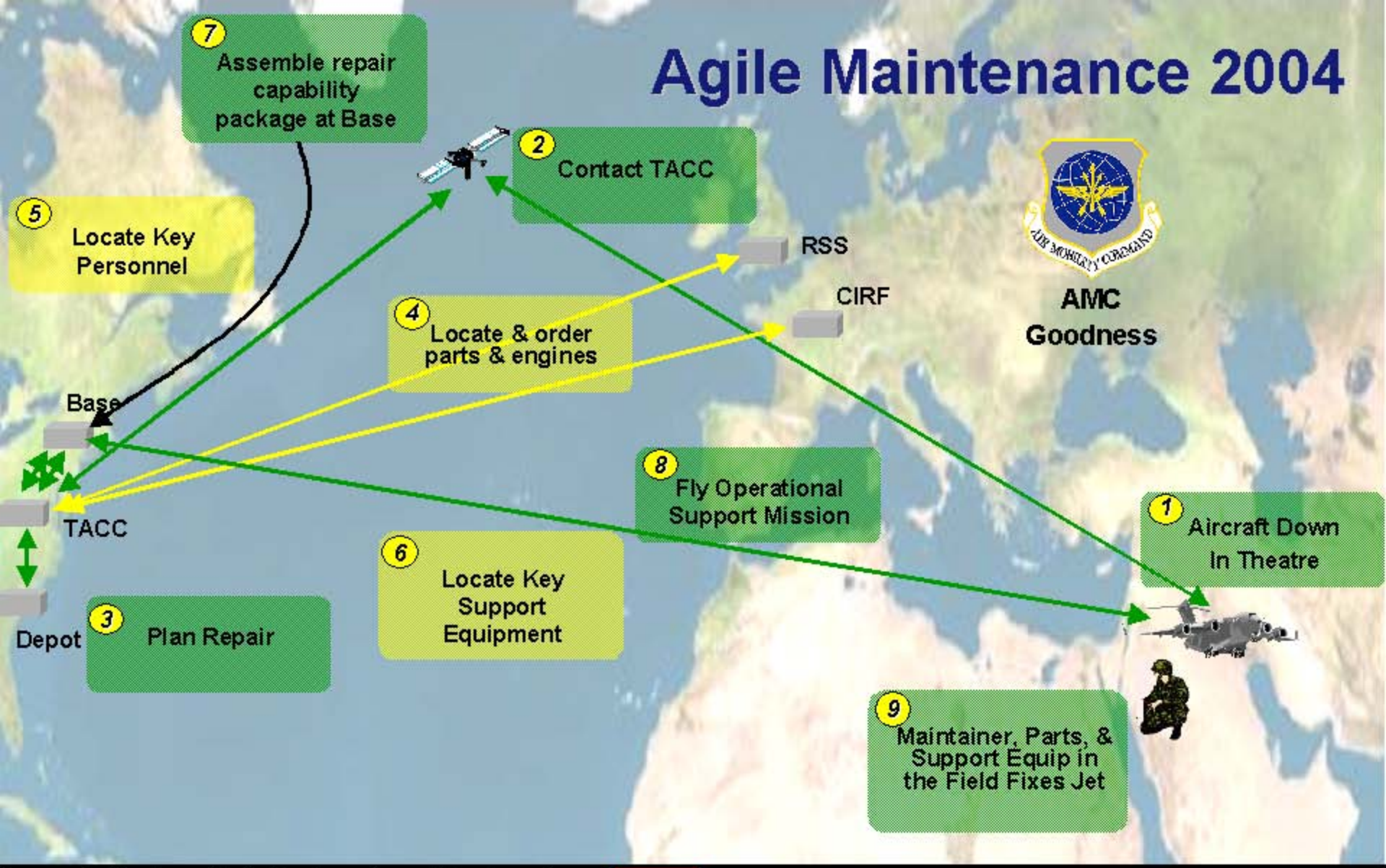
2 Prepare the mission
-ID & prep personnel
- Resource equipment
-Allocate transport

1 Validation & source requirement



	Number of manual processes (% of total)	Number of data sources	Number of processes where CC visibility is a challenge
2004	32 (76%)	61	24 (57%)
2011	29 (69%)	46	22 (52%)

Agile Maintenance 2004



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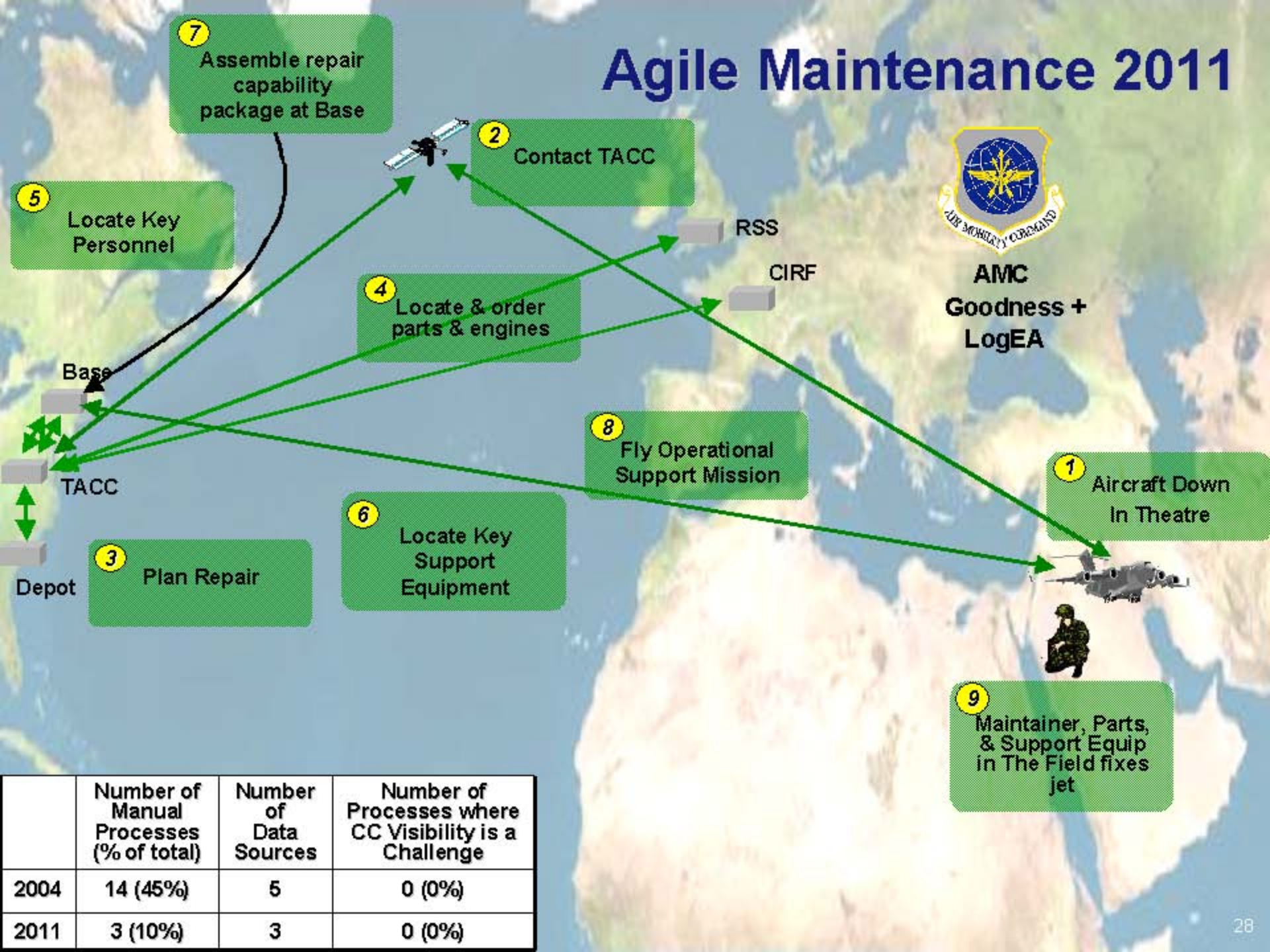
Agile Maintenance 2011



	Number of Manual Processes (% of total)	Number of Data Sources	Number of Processes where CC Visibility is a Challenge
2004	14 (45%)	5	0 (0%)
2011	3 (10%)	3	0 (0%)

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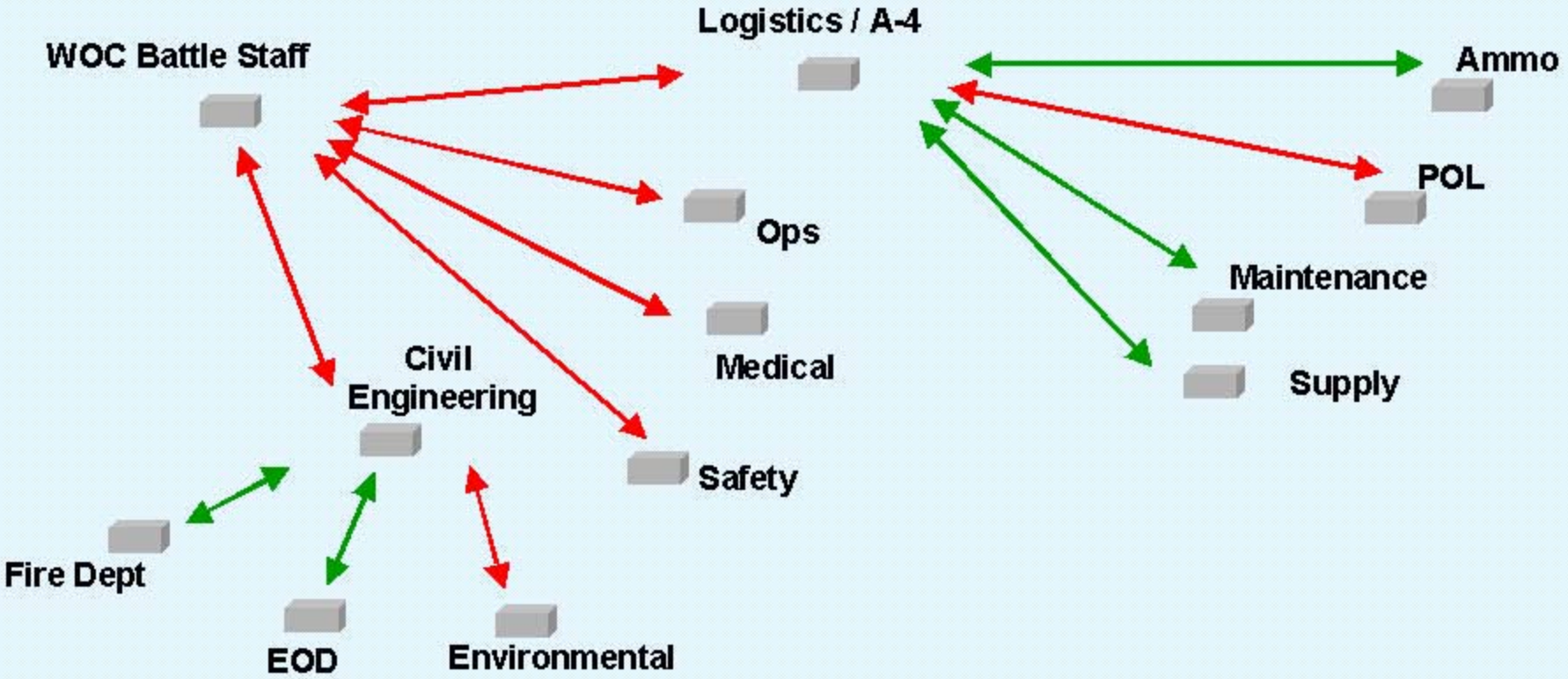
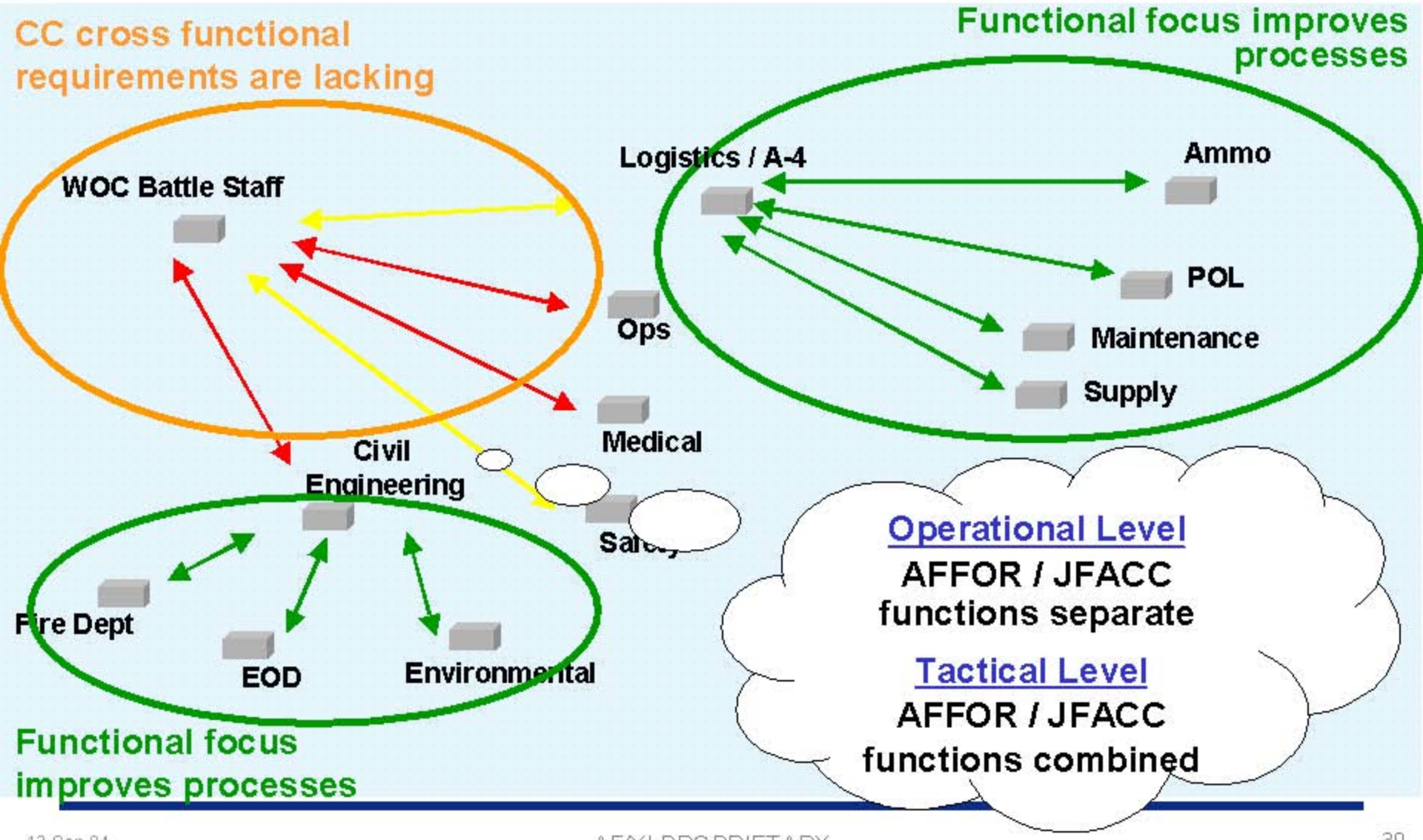
All Vignettes Focused OS C2

Notional 2004 Base Level



Focused OS C2

Notional 2011 Base Level as programmed



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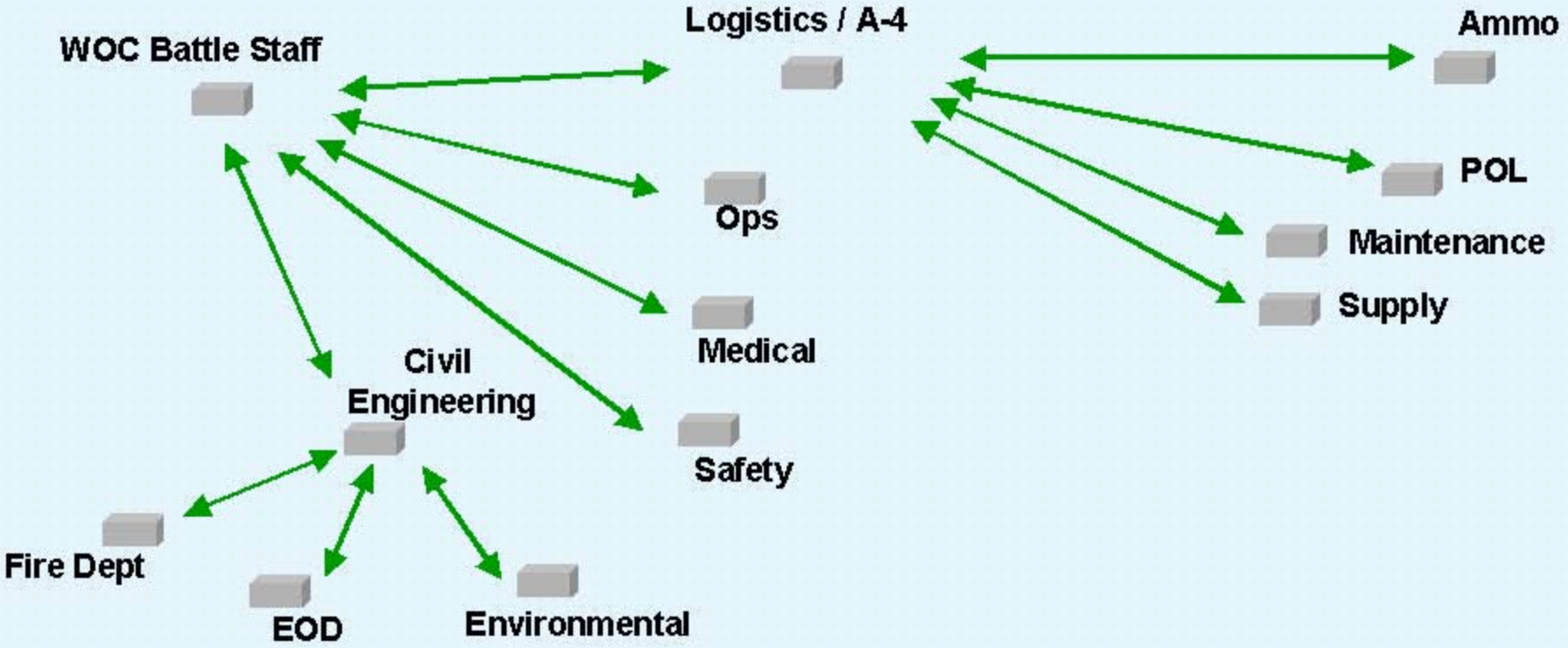
Focused OS C2

Base Level 2011 should be

C2 focus flows needed information to the CC

Functional focus improves processes



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New Dragons

- **Stealth Platform Networking**
  F-22, F-35, UCAV, B-2, F-117
- **ISR Integration of Air & Space assets**
  NCCT, AT3, Suter III, GNCST
- **Standardizing Quality of Service across domains**
  Tracks, Warning messages, VOIP, Video, Text Chat
- **Challenges in JTRS Radio programs**
  - **MIDS JTRS – Keep Funded, incorporate IP quickly**
  - **AMF – MP-CDL & FAB-T fielding timeline**
  - **Cluster 1 – Integration with Air and Ground IP (TACP)**

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NCW Take Aways

- In everything you build, think …
  - Standard IP Protocol
  - Consider Coalition / Joint impacts
  - Assure security … but enable access (mask source)
  - Put applications on a strict bandwidth diet
  - Common coordinate system – WGS-84 decimal minutes
- Latency matters – COP ⇨ CTP ⇨ Sensors Forward
- Time tag events
- If only $2 avail … Connectivity before Applications

NCW is here to enable the most valuable asset — THE WARFIGHTER!!

In Summary

Air Force is fully committed to co-developing integrated capabilities delivering **Joint effects** by significant investment in resources, time and people to advance **Joint Net-Centric Capability**

Goal : When placing the Cursor over the Target, the Warfighter Doesn't Care Where the Info Came From

E-10 - Tailor able Battle Management for Joint C2

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Multi-INT
SBR Connectivity

Special Ops
Time Sensitive Targeting (TST)
Cruise Missile Defense
Combat Search and Rescue

Battle Management
UAV Control
Target Cueing

Airborne
Command Elements

Notional